CPD

ADVECO
HOT WATER SPECIALISTS

Cylinder Range

1

ADVECO
HOT WATER SPECIALISTS

Agenda

- Glass lined ranges
- Stainless ranges
- Stats and Pockets
- Maintenance

2

Adveco Cylinder Ranges

- Buffer/Indirect/Twin Coil
- Glass Lined
  - AO Smith ST/IT/ITS range
  - GLE/GLC/GLT range
- Stainless Steel
  - SSB/SSI/SST
  - ATSB/ATSI/ATST

3

AOS ST/IT/ITS

- Glass lined cylinders
- ST: buffer; IT: one coil
- Basically obsolete
- Used for direct replacement and applications needing large coils
- Used for McDonalds until 2017
  - ITE400 with 18/9 immersion and heat recovery
  - ST300 was installed in initial packaged plantrooms

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HOT WATER SPECIALISTS

AOS ST/IT/ITS

- Maintenance
- Draindown and clean as often as necessary
- Descale any immersions
- Replace sacrificial anode in top

- Replacement
- ITE400 is still available
- ST300 is not available, would need to replace with another cylinder type

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ADVECO
HOT WATER SPECIALISTS

GLE/GLC/GLT

- Glass Lined Cylinders
- GLE: buffer; GLC: one coil; GLT: 2 coils
- 1 or 2 anodes (top half, flange plate)
- Used in many PPRs until 2024
- Used in some McDonalds internals due to low height
- Good in hard water. Requires good maintenance in soft water.
  - Under 100ppm we do not usually use them for McDonalds anymore.

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ADVECO
HOT WATER SPECIALISTS

GLE/GLC/GLT

- Maintenance
- Draindown and clean as often as necessary
- Descale any immersions
- Replace sacrificial anode in top

- Replacement
- In hard water areas like for like
- In soft water areas replace for ATSI 210

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ADVECO
HOT WATER SPECIALISTS

SSB/SSI/SST

- Stainless Steel Cylinder
- Removable coil for flexibility
- Only a few in McDonalds, but if you need a tank that can be used for anything this is the one

8

SSI Installation

- Location
- Clearances
- Dimensions
- Orientation
- Safe Working/lifting
- Anticipate
- Future Maintenance
- Accessibility

9

SSI coils

- **Heat Battery (coil)**
- Provide access & check that clearances are acceptable for future maintenance activities.
- When renewing/replacing gasket Apply (WRAS approved) paste to both sides of the gasket.
- Heat batteries may require a two-person lift for lift weight & alignment with bolt holes.
- Hint Tip,
- To support the heat battery, offer up 1 x bolt at the 3 O'clock position & 1 x bolt at the 9 O'clock position, carefully screw these two bolts from the back so thread facing forward, to aid holding the battery in place, then turn around when remaining bolts are screwed in.

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ADVECO
HOT WATER SPECIALISTS

SSB/SSI/SST

- Maintenance
- Draindown and clean as often as necessary
- Descale any immersions
- Removable coil for better access

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ADVECO
HOT WATER SPECIALISTS

HSG274pt2

- Descale and clean as required in line with HSG274part2

Table 2.1: Checklist for hot and cold water systems

Action to take	Frequency
Inspect calorifier internally by removing the inspection hatch or using a boroscope and clean by draining the vessel. The frequency of inspection and cleaning should be subject to the findings and increased or decreased based on conditions recorded	Annually, or as indicated by the rate of fouling

- If scale does not form, drain and clean is not required yearly

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HOT WATER SPECIALISTS

ATSB/ATSI/ATST

- Stainless Steel Cylinder
- ATSB: Buffer; ATSI: single coil; ATST: twin coil
- Fixed coil(s)
- Bracket mounts
- McDonalds tank
  - 210L used in packaged plantrooms
  - 400L twin coil used in internal stores

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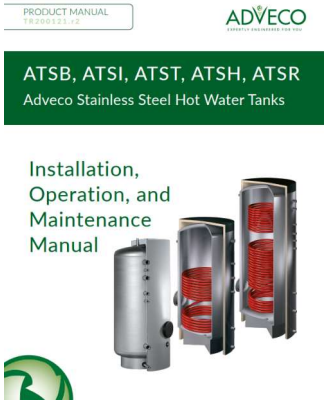
ATST Installation Instructions



Contents: Installation Manual

Page 9: (Section 7) Dimensions

Page 13: (Section 11) Installation General

Page 14: (Section 12) Discharge Pipework

Page 18: Maintenance Checks

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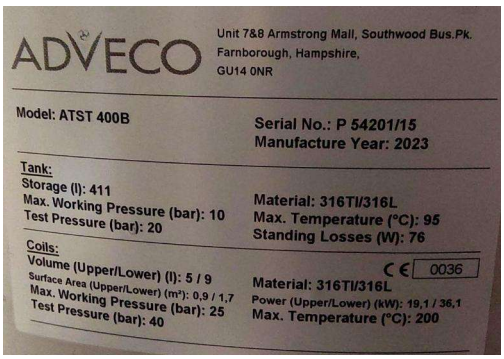
ATST Identification

- **Appliance Badge:**
- **Model Serial Number**
- **Year**
- **411 ltrs 316TI/3016L**
- **10 Bar Max 95c Max**
- **Test Pressure 10 bar**
- **Standing Loses 76 watts/24hr**
- **Volume Coil Upper 5 ltr**
- **Volume Coil Lower 9 ltr**
- **Surface Area Upper 0.9 m2**
- **Surface Area Lower 1.7 m2**



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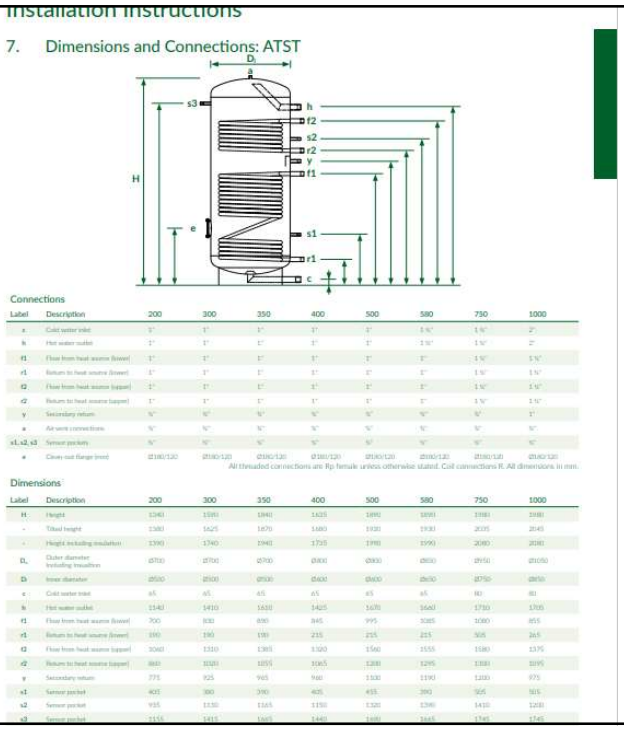
ATST, Dimensions Connections

Page 9: Section 7

Connections

Label	Description
c	Cold water inlet
h	Hot water outlet
f1	Flow from heat source (lower)
r1	Return to heat source (lower)
f2	Flow from heat source (upper)
r2	Return to heat source (upper)
y	Secondary return
a	Air vent connections
s1, s2, s3	Sensor pockets
e	Clean-out flange (mm)



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ATST Installation Instructions: General

Page 13: Section 11

T&P Requirement

Relief Requirement

Cold Feed

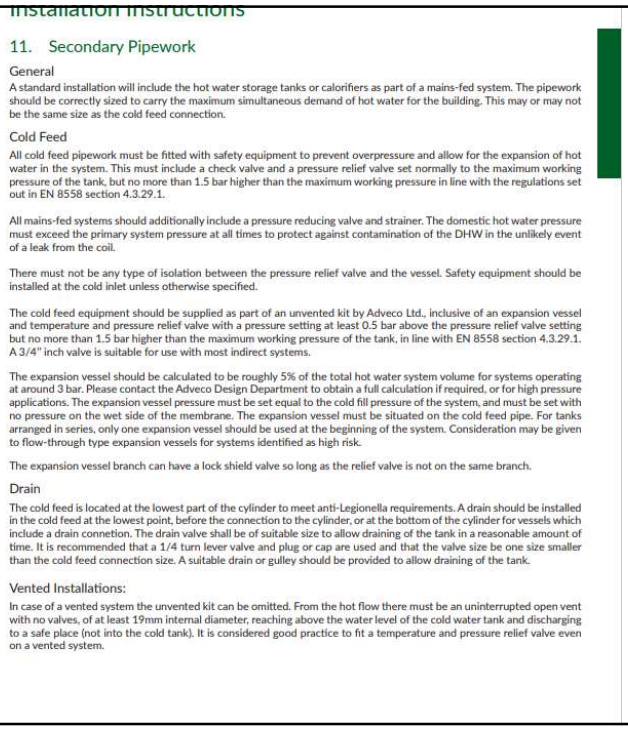
Expansion Vessel

Drain

Vented Installations

Important Note:

Isolation valves & non-return valves, must **NOT** be installed between the local relief valve & the tank cold inlet.



Installation Instructions

11. Secondary Pipework

General

A standard installation will include the hot water storage tanks or calorifiers as part of a mains-fed system. The pipework should be correctly sized to carry the maximum simultaneous demand of hot water for the building. This may or may not be the same size as the cold feed connection.

Cold Feed

All cold feed pipework must be fitted with safety equipment to prevent overpressure and allow for the expansion of hot water in the system. This must include a check valve and a pressure relief valve set normally to the maximum working pressure of the tank, but no more than 1.5 bar higher than the maximum working pressure in line with the regulations set out in EN 8558 section 4.3.29.1.

All mains-fed systems should additionally include a pressure reducing valve and strainer. The domestic hot water pressure must exceed the primary system pressure at all times to protect against contamination of the DHW in the unlikely event of a leak from the coil.

There must not be any type of isolation between the pressure relief valve and the vessel. Safety equipment should be installed at the cold inlet unless otherwise specified.

The cold feed equipment should be supplied as part of an unvented kit by Adveco Ltd., inclusive of an expansion vessel and temperature and pressure relief valve with a pressure setting at least 0.5 bar above the pressure relief valve setting but no more than 1.5 bar higher than the maximum working pressure of the tank, in line with EN 8558 section 4.3.29.1. A 3/4" inch valve is suitable for use with most indirect systems.

The expansion vessel should be calculated to be roughly 5% of the total hot water system volume for systems operating at around 3 bar. Please contact the Adveco Design Department to obtain a full calculation if required, or for high pressure applications. The expansion vessel pressure must be set equal to the cold fill pressure of the system, and must be set with no pressure on the wet side of the membrane. The expansion vessel must be situated on the cold feed pipe. For tanks arranged in series, only one expansion vessel should be used at the beginning of the system. Consideration may be given to flow-through type expansion vessels for systems identified as high risk.

The expansion vessel branch can have a lock shield valve so long as the relief valve is not on the same branch.

Drain

The cold feed is located at the lowest part of the cylinder to meet anti-Legionella requirements. A drain should be installed in the cold feed at the lowest point, before the connection to the cylinder, or at the bottom of the cylinder for vessels which include a drain connetion. The drain valve shall be of suitable size to allow draining of the tank in a reasonable amount of time. It is recommended that a 1/4 turn lever valve and plug or cap are used and that the valve size be one size smaller than the cold feed connection size. A suitable drain or gulley should be provided to allow draining of the tank.

Vented Installations:

In case of a vented system the unvented kit can be omitted. From the hot flow there must be an uninterrupted open vent with no valves, of at least 19mm internal diameter, reaching above the water level of the cold water tank and discharging to a safe place (not into the cold tank). It is considered good practice to fit a temperature and pressure relief valve even on a vented system.

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- Unvented kits
  - No valve after SRV, if you need a valve, you need another SRV
  - Equal pressure cold feed problems
  - Water meter location

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ATST Discharge Pipework

Page 14 Section 12

Building Regs Part G

T&P Discharge Pipe.

D1 Size: Discharge pipe size must not be less than **T&P outlet**

Tundish

D2 Size: Must increase

In size (One size larger than D1).

Installation Instructions

12. Discharge Pipework

Discharge from relief valves

Diagram 1 **Typical discharge pipe arrangement**

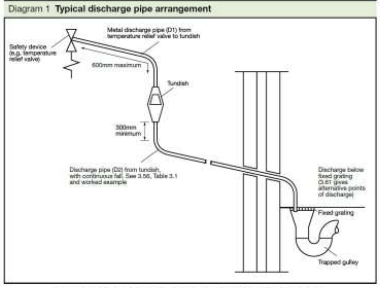

Figure 3: Discharge pipework diagram (as found in Building Regulations Part G).

Discharge pipework requirements for the UK are found in Building Regulation Part G. They are summarised here but it is recommended to read the regulations in full at http://www.planningportal.gov.uk/buildingregulations/approveddocuments/partg/approved

D1, the pipe from the relief valve to the air break, must have the same diameter as the valve, must be metal, and must be no longer than 600mm. An airbreak, such as a tundish or a funnel, must be installed at the end of D1.

D2, the pipe from the air break to termination, must be at least one size larger than D1, must have at least 300mm vertical drop before a bend, and must have a continuous fall. It should typically be metal, but PP is acceptable (note: PP is push-fit plastic. ABS and PVC solvent welded plastics are not suitable).

If D2 is longer than 9m total equivalent length (based on 1.4m per bend), then its diameter must be increased. Please refer to Building Regulation G3 at http://www.planningportal.gov.uk/buildingregulations/. If a number of D2 pipes are combined, the diameter of the common pipe should be one size larger than the biggest D2 pipe.

D2 should be terminated in one of the following ways:

- Into a soil stack, suitable for the temperature, with a mechanical seal, and with no sanitary appliances on it and a warning not to use the pipe for sanitary appliances.
- Into a trapped gulley with the pipe end below the grate but above the water seal.
- Terminating at low level to a suitable external ground level surface with a guard around the pipe end and that end within 100mm of the ground
- At high level into a suitable hopper or onto a roof that can withstand the temperature and does not have plastic guttering within 3m of the discharge and does not create a risk to people below.

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ATST Maintenance Checks

Page 18 Section: Maintenance

In the first year after installation (or sooner if required), some sites may require additional maintenance visit, based on water condition (additional planned descale visits).

Checks to carry out

Safety/control devices functional

Relief valves operate and discharge correctly

Cleaning

Drain down, descale as required

All heater batteries should be descaled

Maintenance Operations

Hot water system maintenance should be determined by the building's risk assessment and legionella protection policy. While full maintenance and cleaning of tanks should be carried out by a trained operative, there are regular hot water system maintenance checks that must be carried out more frequently and can be done by the building controller's nominated person. These include monthly checks of the hot water temperature and regular flushing of low use outlets.

The more involved maintenance regime of a tank will vary from site to site depending on water conditions and use. Maintenance must take place at least yearly, but more frequent visits may be required depending on the condition of the unit after one year. The main reason for frequent maintenance is due to scale formation in the tank. Consideration should be given to scale control in hard water areas to reduce descale frequency.

The maintenance of a tank involves checking the system and cleaning the tank.

Checks to carry out:

Temperature is correct and above 60°C.
Return temperature is above 50°C and in line with relevant local regulations.
Furthest outlet temperature is above 50°C (55°C for healthcare) in 60 seconds.
All control thermostats are calibrated and correctly shuts off heat source.
All overheat thermostats are functional and stop heat input to the tank.
Relief valves operate and discharge correctly.
All valves travel free.
The system has no leaks.
The pressure of any expansion vessel on the cold feed pipework is equal to the cold feed pressure (checked when there is no pressure on the water side of the diaphragm).

Cleaning:

All filters should be cleaned.
The tank should be drained down, cleaned and descaled.
All heater batteries should be descaled.

Drainage Procedure:

Turn off all direct or indirect heat sources connected to the vessel.
Turn off any system pumps and isolate all connections to and from the vessel.
Ensure that the vessel drain connection is connected to, or positioned over, a drain or gulley. For pressurised systems, open the drain valve connection to release the pressure within the vessel.
Open a safety valve on the tank to allow air into the unit and prevent negative pressure build-up during drainage. Alternatively, ensure there is no isolation between the DHW outlet of the tank and a draw-off point, and open the tap. Allow the water in the pipework to drain, and leave the tap open to allow ingress of air to the vessel.
Allow the vessel to fully drain via the drain valve connection.

Note that for ATSI, ATST, ATSH and ATSR vessels, the indirect heating coils may also need to be drained. This should be done via a drainage point included on the primary pipework.

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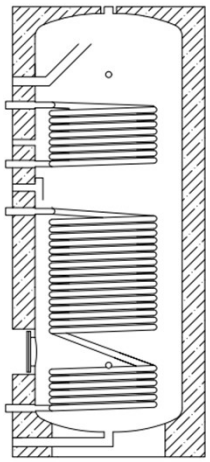
ADVECO HOT WATER SPECIALISTS

Stats and Pockets

- Every heat source has control and overheat protection



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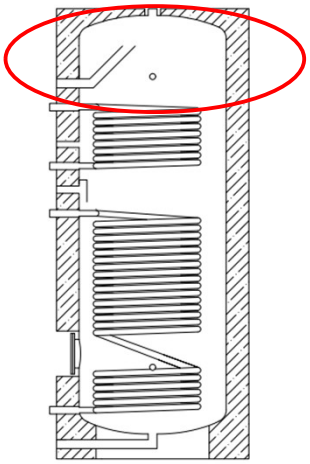
ADVECO HOT WATER SPECIALISTS

Stats and Pockets

- Every heat source has control and overheat protection
  - Overheat protection in top of tank, set to 90-95
    - Unless it is a dual stat and the temp is set lower to counter the position (usually 80C)



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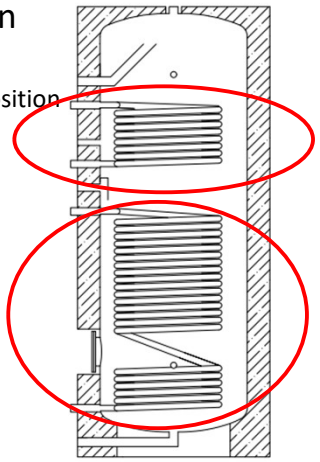
ADVECO HOT WATER SPECIALISTS

Stats and Pockets

- Every heat source has control and overheat protection
  - Overheat protection in top of tank, set to 90-95
    - Unless it is a dual stat and the temp is set lower to counter the position
  - Control stats located within coil, or just above



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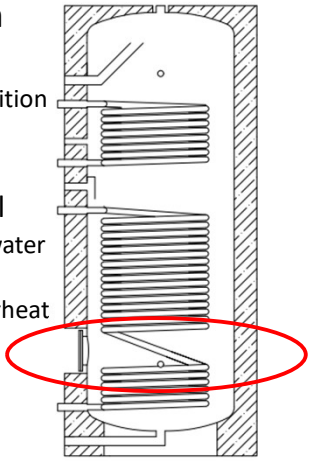
ADVECO HOT WATER SPECIALISTS

Stats and Pockets

- Every heat source has control and overheat protection
  - Overheat protection in top of tank, set to 90-95
    - Unless it is a dual stat and the temp is set lower to counter the position (usually 80C)
  - Control stats located within coil, or just above
  - Immersion heater requires control and overheat stat as well
    - For backup it could be in the immersion head – if not too big and water is moving (run destrat)
    - If an immersion is lead then it must have separate control and overheat stat in tank
      - This is better for backup too, if enough pockets



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ADVECO
HOT WATER SPECIALISTS

Stats and Pockets

- Control and overheat stats come as capillary type or pocket mount.
- Dual stats are always pocket mount in a double pocket
- Pocket mount stats and overheats look tidier, but you are limited to one stat per pocket
- Where you need more than one stat or overheat then use capillary type and multipockets
- Use copper pockets for glass lined cylinders
- Use stainless or chrome for stainless cylinders.
- Thick insulation cylinders need long pockets
  - Tease out phial of pocket mounted stat

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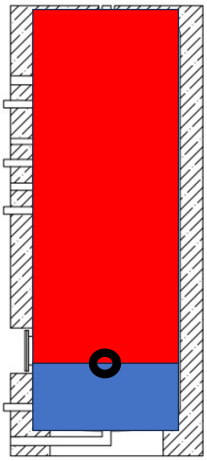
ADVECO
HOT WATER SPECIALISTS

Stats and Pockets

- Water under a stat should be expected to be cold



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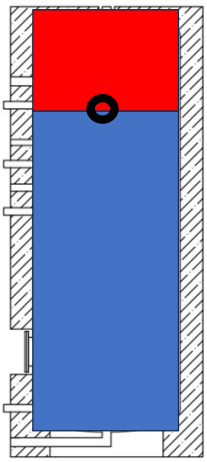
Stats and Pockets

- Water under a stat should be expected to be cold
  - With only one heat source in bottom, stat must be in bottom



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ATST Maintenance Checks

Page 18 Section: Maintenance

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Checks to carry out

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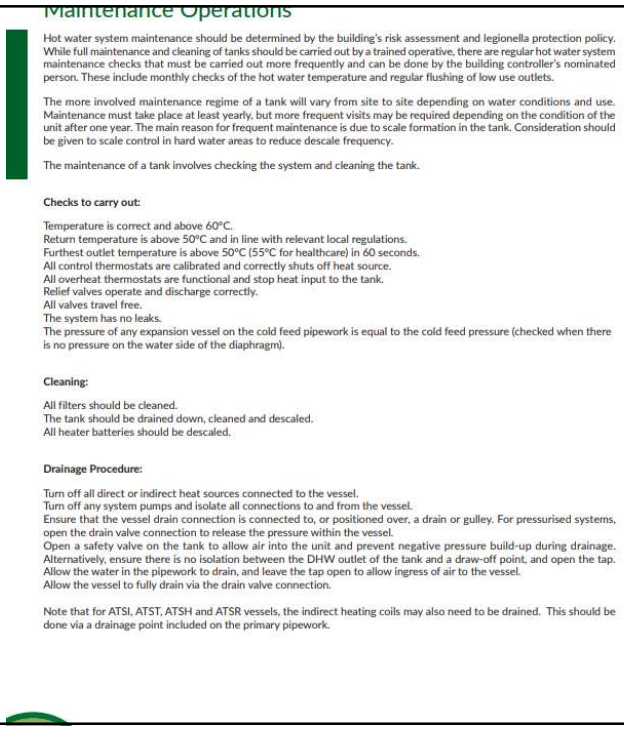
Cleaning

Drain down, descale as required

All heater batteries should be descaled



Maintenance Operations

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Drainage Procedure:

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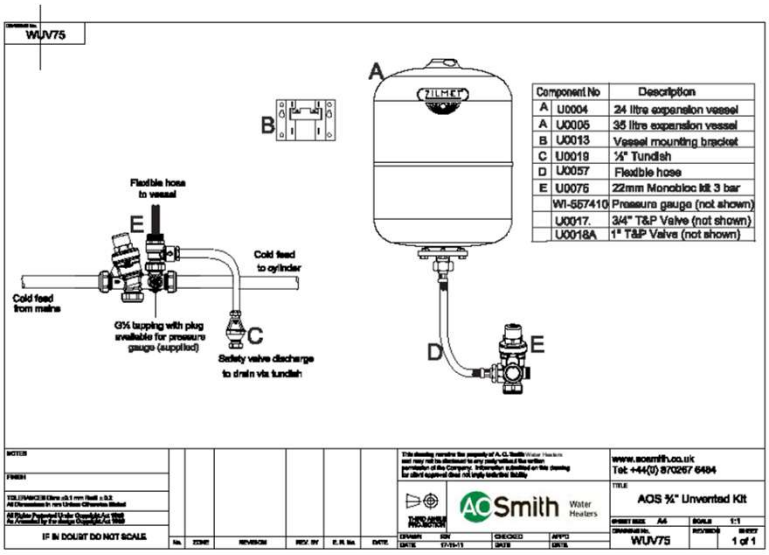
ADVECO HOT WATER SPECIALISTS

Maintenance

General Checks

Unvented Kit

- Pressure Control Group
- Visual Check, signs of discharge, tundish wet,
- Expansion Vessel Pre Charge.
- Where necessary check condition of Anode



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ADVECO HOT WATER SPECIALISTS

Maintenance

General Checks

Unvented Kit

- Temperature & Pressure Relief Valve
- Visual Check, signs of discharge, tundish wet,

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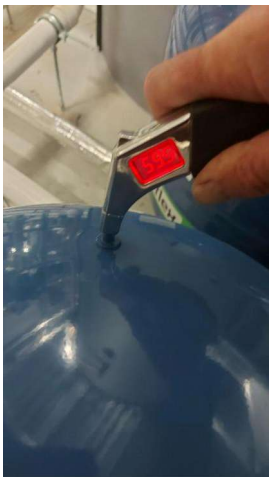
ADVECO HOT WATER SPECIALISTS

Maintenance

General Checks

- Check with Store Manager if any issues between service intervals
- Unvented kit
- Expansion Vessel
- Safety Valves
- Leaks
- Pumps
- Strainers
- Glycol Strength
- Temperature at outlets



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ADVECO HOT WATER SPECIALISTS

Maintenance

- Tanks
  - Replace anodes where necessary
    - Old tanks are glass lined with anodes
    - New tanks are stainless steel
  - Safety valve check
  - Descale and clean as required in line with HSG274part2

Table 2.1: Checklist for hot and cold water systems

Action to take	Frequency
Inspect calorifier internally by removing the inspection hatch or using a boroscope and clean by draining the vessel. The frequency of inspection and cleaning should be subject to the findings and increased or decreased based on conditions recorded	Annually, or as indicated by the rate of fouling

  - If scale does not form, drain and clean is not required yearly

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